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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/729,452	12/04/2003	Robert David Allen	ARC920030104US1	2060
23980 7590 04/16/2009 MINTZ, LEVIN, COHN, FERRIS, GLOVSKY AND POPEO, P.C 5 Palo Alto Square - 6th Floor 3000 El Camino Real PALO ALTO, CA 94306-2155				
EXAMINER				
CHU, JOHN S Y				
ART UNIT		PAPER NUMBER		
1795				
MAIL DATE		DELIVERY MODE		
04/16/2009		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/729,452

**Applicant(s)**

ALLEN ET AL.

**Examiner**

JOHN S. CHU

**Art Unit**

1795

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 2/4/2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-15, 18, 19 and 21-35 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15, 18, 19 and 21-35 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/S508)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

This Office action is in response to the amendment filed February 4, 2009.

#### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 24, 32-35 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 24, the definition for  $L^3$  has been deleted and as a result Formula III is now indefinite under 35 U.S.C. 112, second paragraph. **The claim is still indefinite where claim 1 defines  $L^3$  however it is under the variable  $R^H$  and not linked to the structure as defined in claim 24, so the claim is unclear is can be confusing to one attempting to read the scope and definition of the claims in a patent. Correction is necessary to clarify the definition.**

#### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-15, 18, 19, and 21-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over CHOI in view of HOULIHAN et al (2004/0265733).

The claimed invention is drawn to the following:

1. **(Currently amended)** A process for patterning a substrate, comprising:

(a) coating the substrate with a film of a photoresist composition comprised of (i) a polymer that is rendered soluble in aqueous base at a temperature of less than about 100°C by acid-catalyzed deprotection of pendent acetal- or ketal-protected carboxylic acid groups, and (ii) a photoacid generator;

(b) patternwise exposing the film to an imaging radiation source so as to form a latent, patterned image in the film;

(c) baking the exposed film at a post-exposure bake temperature between about 25°C and 80°C; and

(d) developing the latent image with a developer to form a patterned substrate,

wherein the polymer is prepared by polymerization of a monomer mixture, the mixture comprising (a) at least one first olefinic monomer containing an acetal or ketal linkage, the acid-catalyzed cleavage of which renders the polymer soluble in aqueous base, and (b) at least one second olefinic monomer selected from (i) an olefinic monomer containing a pendant fluorinated hydroxyalkyl group  $R^{11}$ , (ii) an olefinic monomer containing a pendant fluorinated alkylsulfonamide group  $R^8$ , and (iii) combinations thereof, wherein  $R^{11}$  has the formula  $-L^3-CR^{11}R^{12}-OH$ , in which:

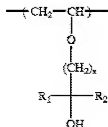
$L^3$  is selected from  $C_1-C_{12}$  alkylene, substituted  $C_1-C_{12}$  alkylene,  $C_3-C_{15}$  alicyclic,  $C_3-C_{15}$  fluoroalicyclic, and combinations thereof;

$R^{11}$  is selected from hydrogen,  $C_1-C_{24}$  alkyl, and substituted  $C_1-C_{24}$  alkyl; and

$R^{12}$  is  $C_1-C_{24}$  alkyl or fluorinated  $C_1-C_{24}$  alkyl, provided that at least one of  $R^{11}$  and  $R^{12}$  is fluorinated, and further wherein  $R^{11}$  and  $R^{12}$  can be taken together to form a ring.

CHOI discloses a photosensitive polymer and photoresist composition comprising a hydroxyl vinyl ether monomer and a fluorinated alkyl group and a perfluorinated alkyl group

monomer, see [paragraph \[0018\]](#) for the following monomer



The  $R_1$  and  $R_2$  are defined as C1 to C20 alkyl groups, C1 to C10 fluorinated alkyl groups or C1 to C10 perfluorinated alkyl groups which meet the recited (i) olefinic monomer containing a fluorinated hydroxyl alkyl group. The recited acetal- or ketal- protected carboxylic group is met by the side groups disclosed in [paragraph \[0029\]](#), specifically tetrahydropyranyl, or 1-ethoxy ethyl.

The recited method in [paragraph \[0049\]](#) discloses an exposure step to KrF, ArF and  $F_2$  with a post-exposure bake step between  $90^\circ\text{C}$  to  $180^\circ\text{C}$ . The disclosed range fails to meet the now claimed range of between  $25^\circ\text{C}$  and  $80^\circ\text{C}$ .

The reference lacks a working example showing a method using a polymer having the acetal- or ketal- group monomer and a hydroxyl alkyl fluorinated monomer wherein the method has a post-exposure bake step of between  $25^\circ\text{C}$  and  $80^\circ\text{C}$ .

HOULIHAN et al discloses photolithographic method wherein the range for the post-exposure bake step is between  $50^\circ\text{C}$  and  $80^\circ\text{C}$ , see [paragraph \[0044\]](#). However the disclosure of the reference lacks a working example showing a method using a polymer having the acetal- or ketal- group monomer and a hydroxyl alkyl fluorinated monomer wherein the method has a post-exposure bake step of between  $50^\circ\text{C}$  and  $80^\circ\text{C}$  as claimed.

It would have been *prima facie* obvious to one of ordinary skill in the art of pattern formation to use a photoresist compositions comprising a copolymer having monomers with an acetal –or ketal protected carboxylic group as exemplified in paragraph [0029] such as tetrahydropyranyl and 1-ethoxy ethyl groups and a hydroxy alkyl containing fluorinated monomer and have a post-exposure bake step between 50° C and 80° C and reasonably expect same or similar results as recited in CHOI and HOULIHAN et al for excellent transparency at short wavelengths good adhesion, and high resistance to dry etching.

**The arguments have been carefully considered, however the rejection is repeated based on the claims being given the broadest reasonable interpretation such that R<sup>H</sup> as defined can be met by the prior art of CHOI et al if the oxygen in the unit is seen to be a substituted alkylene group as defined for L3.**

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Chu whose telephone number is (571) 272-1329. The examiner can normally be reached on Monday - Friday from 9:30 am to 6:00 pm.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Cynthia Kelly, can be reached on (571) 272-1526

The fax phone number for the USPTO is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PMR only. For more information about the PAIR

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system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/John S. Chu/  
Primary Examiner, Art Unit 1795

J.Chu  
April 13, 2009